

photoresist layer with a plasma to create an exposed portion of the hardmask layer, removing the exposed portion, and after removing the exposed portion, creating a trench through the trench guide opening with a plasma. As noted by the Examiner Tseng fails to teach creating a trench after the exposed portion of the hardmask is removed. Nagarajan teaches the steps of vertically etching a trench, trimming a photoresist layer and, if necessary, repeating the vertically etching and trimming steps. Nagarajan does not teach a hardmask. Thus, there is no suggestion provided by Nagarajan for creating a trench after removing an exposed portion of a hardmask. There is no disclosure or suggestion in the combined references of removing an exposed portion of a hardmask to create a trench guide opening and then creating a trench through the trench guide opening. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are patentable over the references.

The Examiner rejected claims 2, 4, and 8-9 under 35 U.S.C. § 103(a) as being unpatentable over Tseng (U.S. Patent 6,093,621), of record, in view of Nagarajan (U.S. Pub. No. 2002/0166838), newly cited as applied to claim 1 above, and further in view of Miller (U.S. Patent 6,287,974).

Applicant respectfully submits that claims 2, 4, 8, and 9 are patentable over Tseng in view of Nagarajan and Miller as there is no disclosure or suggestion in the references of after removing the exposed portion of the hardmask layer, creating a trench through the trench guide opening with a plasma, as required by claim 1 from which these claims depend. As discussed above, the combination of Tseng and Nagarajan fails to disclose or suggest this feature. Miller is applied to teach the use of a BARC, employing the same plasma tool, and specific flow rates, source power and bias power. The combination of Tseng, Nagarajan, and Miller fails to teach or suggest after removing the exposed portion of the hardmask layer, creating a trench through the trench guide opening with a plasma. Accordingly, Applicant respectfully submits that claims 2, 4, 8, and 9 are patentable over the references.

The Examiner rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Tseng (U.S. Patent 6,093,621), of record, in view of Nagarajan (U.S. Pub. No. 2002/0166838), newly cited, as applied to claim 1 above, and further in view of Kadosh et al. (U.S. Patent 5,770,483), of record.

Applicant respectfully submits that claim 10 is patentable over the references for the same reasons discussed above relative to claim 1, from which claim 10 depends.

The Examiner rejected claims 11, 13, 15-17, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Tseng (U.S. Patent 6,093,621), of record, in view of Nagarajan (U.S. Pub. No. 2002/0166838), newly cited, further in view of Kadosh et al. (U.S. Patent 5,770,483), of record.

Applicant respectfully submits that claim 11 is patentable over the references as there is no disclosure or suggestion in the references of after removing the exposed portion of a hardmask, creating a trench through a trench guide opening with a plasma, as required by the claim. Tseng does not teach creating a trench through the trench guide opening with a plasma after removing the exposed portion of layer 104. Nagarajan teaches the steps of vertically etching a trench, trimming a photoresist layer and, if necessary, repeating the vertically etching and trimming steps. Nagarajan does not teach a hardmask. Thus, there is no suggestion provided by Nagarajan for creating a trench after removing an exposed portion of a hardmask. Kadosh is added to teach forming trench isolation between active areas and forming transistors in the active areas and interconnects over the transistors. The combined references fail to disclose or suggest after removing the exposed portion of a hardmask, creating a trench through a trench guide opening with a plasma, as required by the claim. Accordingly, Applicant respectfully submits that claim 11 and the claims dependent thereon are patentable over the references.

The Examiner rejected claims 12, 14, and 18-19 under 35 U.S.C. § 103(a) as being unpatentable over Tseng (U.S. Patent 6,093,621), of record, in view of Nagarajan (U.S. Pub. No. 2002/0166838), newly cited, further in view of Kadosh et al. (U.S. Patent 5,770,483), of record, as applied to claim 11 above, and further in view of Miller (U.S. 6,287,974).

Applicant respectfully submits that claims 12, 14, 18, and 19 are patentable over the references for the same reasons discussed above relative to claim 11 from which these claims depend. Miller is applied to teach the use of a BARC, employing the same plasma tool, and specific flow rates, source power and bias power. The combination of the references fails to teach or suggest after removing the exposed portion of the

hardmask layer, creating a trench through the trench guide opening with a plasma. Accordingly, Applicant respectfully submits that claims 12, 14, 18, and 19 are patentable over the references.

The other references cited by the Examiner have been reviewed, but are not felt to come within the scope of the claims as amended.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-20. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,

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